

WHAT IS CLAIMED IS:

1. Method for depositing a thin film on a substrate surface of material dissimilar to said thin film, comprising steps of; carrying out a treatment for reducing interfacial defects between said substrate surface and said thin film by a catalytic reaction of a treatment gas which is supplied with said substrate via a thermal catalysis body provided near said substrate surface, and depositing said thin film on said surface after said treatment.
2. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said deposition is carried out by another catalytic reaction of a deposition gas which is supplied with said substrate surface via said thermal catalysis body.
3. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said material of said substrate surface is semiconductor and said thin film is insulator.
4. Method for depositing a thin film on a substrate surface as claimed in claim 3, wherein said material of substrate surface is Si, Ge, SiGe, SiC, GaAs, GaAlAs, GaP, InP, ZnSe or CdS.
5. Method for depositing a thin film on a substrate surface as claimed in claim 3, wherein said thin film is silicon oxide film, silicon nitride film, silicon oxygen nitride film, aluminum nitride film or aluminum oxide film.
6. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said material of said substrate surface is semiconductor of gallium arsenide series, said treatment gas is nitrogen bearing gas or hydrogen gas, and said treatment is surface cleaning or surface denaturalizing.
7. Method for depositing a thin film on a substrate surface as claimed in claim 6, wherein temperature of said substrate is kept below 400°C.
8. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein temperature of said substrate is kept lower than temperatures at which said substrate is thermally degraded.
9. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said thermal catalysis body is made of tungsten, molybdenum, tantalum, titanium or vanadium.
10. Apparatus for depositing a thin film on a substrate surface, comprising; a process chamber in which said substrate is placed, a thermal catalysis body provided near said substrate placement, a heater for heating said thermal catalysis body up to an temperature, deposition gas introduction system for introducing a deposition gas into said process chamber and treatment gas introduction system introducing a treatment gas, wherein said thin film is

deposited on said substrate surface utilizing reaction of said deposition gas supplied with said substrate surface via said thermal catalysis body and a treatment for reducing interfacial defects between said substrate surface and said thin film is carried out by supplying said treatment gas with said substrate via said thermal catalysis body in said chamber before said thin film deposition.

11. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein material of said substrate surface is semiconductor and said thin film is insulator.
12. Apparatus for depositing a thin film on a substrate surface as claimed in claim 11, wherein material of said substrate surface is Si, Ge, SiGe, SiC, GaAs, GaAlAs, GaP, InP, ZnSe or CdS.
13. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said thin film is silicon oxide film, silicon nitride film, silicon oxygen nitride film, aluminum nitride film or aluminum oxide film.
14. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said material of said substrate surface is semiconductor of GaAs series, said treatment gas is a nitrogen bearing gas or hydrogen gas, and said treatment is surface cleaning or surface denaturalizing utilizing radicals decomposed from said treatment gas by said thermal catalysis body.
15. Apparatus for depositing a thin film on a substrate surface as claimed in claim 14, wherein said heater heats said thermal catalysis body as far as that temperature of said substrate is kept below 400°C.
16. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said substrate has a wiring for an integrated circuit and said heater heats said thermal catalysis body as far as said temperature of said substrate does not exceed the melting point of said wiring.
17. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said thermal catalysis body is made of tungsten, molybdenum, tantalum, titanium or vanadium.
18. Semiconductor device having a semiconductor-insulator junction obtained by depositing an insulator film on an underlying semiconductor surface, wherein the interfacial level density of said semiconductor-insulator junction is 10^{12} eV⁻¹cm⁻² or less as a result that said insulator film is deposited on said underlying semiconductor surface after a treatment that reduces interfacial defects on said semiconductor-insulator junction utilizing a reaction of a treatment gas supplied with a substrate having said underlying semiconductor via a thermal catalysis body provided near said substrate.

155 B1